IN THE CLAIMS:

1. (Currently amended) A system comprising:

at least one first conductive element and at least one second conductive element so disposed with respect to each other that, when the first and second conductive elements extend through a dielectric mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

a transmitter operable to drive the first electromagnetic signal along the at least one first conductive element without also driving the at least one second conductive element; ~~and~~

a receiver for receiving the second ~~an~~ electromagnetic signal from the at least one second conductive element, the received electromagnetic signal being coupled to the at least one second conductive element in response to the at least one dielectric mismatch boundary; and

a coupler positioned at the dielectric mismatch boundary for coupling the received electromagnetic signal, the size of the received electromagnetic signal being independent of dielectric properties associated with substances forming the dielectric mismatch boundary, wherein the coupler exhibits a length corresponding to at least one-quarter of a propagation velocity pulse length of the transmitted electromagnetic signal.

2. (Previously presented) The system of claim 1 further comprising a third conductive element surrounding at least part of the at least one first and second conductive elements and being connected to a ground plane.

3. (Previously presented) The system of claim 1 wherein the at least one first and second conductive elements are positioned substantially parallel to each other and substantially perpendicular to the at least one dielectric mismatch boundary.

4. (Previously presented) The system of claim 1 wherein the at least one dielectric mismatch boundary corresponds to a region associated with at least one first substance having a first dielectric constant and at least one second substance having a second dielectric constant.

5. (Previously presented) The system of claim 1 wherein the electromagnetic signal exhibits an ultra-wideband frequency.

6. (Previously presented) The system of claim 1 wherein the at least one dielectric mismatch boundary corresponds to a transitional region between a gaseous substance and a liquid substance.

7. (Previously presented) The system of claim 1 wherein the at least one dielectric mismatch boundary corresponds to a transitional region between at least two of a vacuum, a gaseous substance, a liquid substance, a semi-solid substance, and a solid substance.

8. (Cancelled)

9. (Previously presented) The system of claim 1 further comprising a processing element executing instructions to evaluate the received electromagnetic signal relative to the driven electromagnetic signal to determine a characteristic of at least one substance associated with the dielectric mismatch boundary.

10. (Previously presented) The system of claim 9 wherein the processing element communicates at least one of the attributes of the received electromagnetic signal and the characteristic of the at least one substance to a digital data processing device during a communication session.

11. (Previously presented) The system of claim 9 wherein the attributes of the received electromagnetic signal relative to the driven electromagnetic signal includes a time delay and the characteristic of the at least one substance corresponds to a level of that substance.

12. (Previously presented) The system of claim 11 wherein the time delay attribute of the received electromagnetic signal relative to the driven electromagnetic signal is based, at least in part, on a time differential between signals associated with an equivalent time sampling circuit of the receiver.

13. (Previously presented) The system of claim 11 wherein the level corresponds to a volume of fluid in at least one of an above-ground storage tank and a below-ground storage tank.

14. (Previously presented) The system of claim 1 wherein the at least one first and second conductive elements form a parallel conductor transmission line structure.

15. (Previously presented) The system of claim 1 wherein the at least one first and second conductive elements are flexible.

16. (Previously presented) The system of claim 1 wherein the at least one first and second conductive elements exhibit quadrilateral cross-sections.

17. (Previously presented) The system of claim 1 wherein the at least one first and second conductive elements exhibit substantially identical cross-sections.

18. (Cancelled)

19. (Currently amended) The system of claim 1 ~~18~~ wherein the coupler operates as an electromagnetic shunt path between the at least one first and second conductive elements.

20. (Cancelled)

21. (Currently amended) The system of claim 1 ~~18~~ further comprising:

a float for positioning the coupler relative to the at least one dielectric mismatch boundary.

22. (Previously presented) The system of claim 21 wherein the float includes a buoyant component and a weighted component.

23. (Currently amended) A method comprising:

driving a first electromagnetic signal on an at least one first conductive element without also driving an at least one second conductive element, the first conductive element and second conductive element axially separated and so disposed with respect to each other that, when the first and second conductive elements extend through at least one dielectric mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

at least partially circumscribing an area about the at least one first conductive element and the at least one second conductive element with a third conductive element connected to a ground plane; and

receiving, from the at least one second conductive element, a second electromagnetic signal induced by the first electromagnetic signal driven along the at least one first conductive element, the second electromagnetic signal being coupled to the at least one second conductive element in response to the at least one dielectric mismatch boundary.

24. (Cancelled)

25. (Previously presented) The method of claim 23 further comprising:

evaluating attributes of the second electromagnetic signal relative to the first electromagnetic signal to determine a characteristic of at least one substance associated with the dielectric mismatch boundary.

26. (Previously presented) The method of claim 25 wherein the attributes of the second electromagnetic signal relative to the first electromagnetic signal includes a time delay and the characteristic of the at least one substance corresponds to a level of that substance.

27. (Previously presented) The method of claim 23 wherein the at least one first and second conductive elements are flexible.

28. (Previously presented) The method of claim 23 further comprising:

providing a coupler positioned at the dielectric mismatch boundary for coupling the second electromagnetic signal to the at least one second conductive element, the size of the second electromagnetic signal being independent of dielectric properties associated with substances forming the at least one dielectric mismatch boundary.

29. (Previously presented) The method of claim 28 further comprising:

providing a float for positioning the coupler relative to the at least one dielectric mismatch boundary.

30. (New) A method comprising:

driving a first electromagnetic signal on an at least one first conductive element without also driving an at least one second conductive element, the first conductive element and second conductive element so disposed with respect to each other that, when the first and second conductive elements extend through at least one dielectric mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

receiving, from the at least one second conductive element, a second electromagnetic signal induced by the first electromagnetic signal driven along the at least one first conductive element, the second electromagnetic signal being coupled to the at least one second conductive element in response to the at least one dielectric mismatch boundary; and

providing a coupler exhibiting a length corresponding to at least one-quarter of a propagation velocity pulse length of the transmitted electromagnetic signal, the coupler positioned at the dielectric mismatch boundary for coupling the second electromagnetic signal to the at least one second conductive element, the size of the second electromagnetic signal being independent of dielectric properties associated with substances forming the at least one dielectric mismatch boundary.

31. (New) A system comprising:

a first conductive element and a second conductive element, axially separated and so disposed with respect to each other that, when the first and second conductive elements extend through a dielectric mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

a third conductive element at least partially circumscribing an area about the first and second conductive elements and being connected to a ground plane;

a transmitter operable to drive the first electromagnetic signal along the at least one first conductive element without also driving the at least one second conductive element; and

a receiver for receiving the second electromagnetic signal from the at least one second conductive element, the received electromagnetic signal being coupled to the at least one second conductive element in response to the at least one dielectric mismatch boundary.

32. (New) A system for measuring distances, the system comprising:

a first conductive element and a second conductive element so disposed with respect to each other that, when the first and second conductive elements extend through a dielectric

mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

a transmitter operable to drive the first electromagnetic signal along the first conductive element without also driving the second conductive element;

a receiver operable to receive the second electromagnetic signal;

a coupler positioned at the dielectric mismatch boundary for coupling the received electromagnetic signal, the size of the received second electromagnetic signal being independent of dielectric properties associated with substances forming the dielectric mismatch boundary, wherein the coupler exhibits a length corresponding to at least one-quarter of a propagation velocity pulse length of the first electromagnetic signal; and

a processor operable to determine, at least in part from a time delay between the first and second electromagnetic signals, a distance associated with the dielectric mismatch boundary.

33. (New) The system of claim 32 wherein the first electromagnetic signal exhibits an ultra-wideband frequency.

34. (New) The system of claim 32 wherein the receiver is further operable to detect the time delay between the first and second electromagnetic signals.

35. (New) The system of claim 34 wherein the receiver includes an equivalent time sampling circuit.

36. (New) The system of claim 32 wherein the first and second conductive elements form a parallel conductor transmission line structure.

37. (New) The system of claim 32 wherein the first and second conductive elements are flexible.

38. (New) The system of claim 32 wherein the first and second conductive elements exhibit quadrilateral cross-sections.

39. (New) The system of claim 32 wherein the first and second conductive elements exhibit substantially identical cross-sections.

42. (New) The system of claim 32 wherein the distance determined by the processor corresponds to a dimension associated with an object.

43. (New) The system of claim 32 wherein the distance determined by the processor corresponds to a displacement between a plurality of objects.

44. (New) The system of claim 32 wherein the distance determined by the processor corresponds to an angular orientation.

45. (New) The system of claim 32 wherein the distance determined by the processor corresponds to a degree of pressure.

46. (New) The system according to claim 32, wherein the coupler is slidable along the first and second conductive elements for so coupling the first and second conductive elements as to launch the second electromagnetic signal along the second conductive element when the first electromagnetic signal reaches the position of the coupler.

47. (New) The system of claim 46 further comprising a supporting material for slidably receiving the coupler in a channel defined therein, the supporting material maintaining a consistent displacement between the coupler and the first and second conductive elements.

48. (New) The system according to claim 32, wherein the first electromagnetic signal propagates from a first end of the first conductive element toward a second end of the first conductive element, and the propagation of the first electromagnetic signal through the boundary will induce the second electromagnetic signal to propagate along the second conductive element toward a first end of the second conductive element.

49. (New) A method of measuring distances, the method comprising:

driving a first electromagnetic signal along a first conductive element without also driving a second conductive element, where the first and second conductive elements are so disposed with respect to each other that, when the first and second conductive elements extend through a dielectric mismatch boundary, a first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

receiving the second electromagnetic signal;

providing a coupler positioned at the dielectric mismatch boundary for coupling the received electromagnetic signal, the size of the received second electromagnetic signal being independent of dielectric properties associated with substances forming the dielectric mismatch boundary, wherein the coupler exhibits a length corresponding to at least one-quarter of a propagation velocity pulse length of the first electromagnetic signal; and

determining, at least in part from a time delay between the first and second electromagnetic signals, a distance associated with the dielectric mismatch boundary.

50. (New) The method of claim 49 wherein the distance corresponds to a dimension associated with an object.

51. (New) The method of claim 49 wherein the distance corresponds to a displacement between a plurality of objects.

52. (New) The method of claim 49 wherein the distance corresponds to an angular orientation.

53. (New) The method of claim 49 wherein the distance corresponds to a degree of pressure.

54. (New) The method according to claim 49, wherein the coupler couples the first and second conductive elements as to launch the second electromagnetic signal along the second conductive element when the first electromagnetic signal reaches the position of the coupler, and wherein the coupler is slidable along the first and second conductive elements.

56. (New) The method according to claim 49, wherein the first electromagnetic signal propagates from a first end of the first conductive element toward a second end of the first conductive element, and the propagation of the first electromagnetic signal through the boundary will induce the second electromagnetic signal to propagate along the second conductive element toward a first end of the second conductive element.